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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,846	11/08/2006	Makoto Iwai	811_107	3664
25191	7590	11/22/2011	EXAMINER	
BURR & BROWN			SONG, MATTHEW J	
PO BOX 7068			ART UNIT	
SYRACUSE, NY 13261-7068			PAPER NUMBER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/594,846

Applicant(s)

IWAI ET AL.

Examiner

MATTHEW SONG

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 1, 4-6, 11, 13 and 14 is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1, 4-6, 11, 13 and 14 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-CB00)
Paper No(s) Mail Date ____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s) Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Withdrawn Rejections

1. Applicant's arguments, see page 2 of the remarks, filed 9/26/2011, with respect to the rejection(s) of claim(s) 1, 4 and 14 under 35 USC 102 in view of Sasaki (US 2006/0051942) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Sasaki (US 2006/0051942) as a 35 USC 103 obviousness rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 4 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al (US 2006/0051942).

Sasaki teaches a method of fabricating a Group III nitride single crystal whereby a sodium flux is utilized and the nitride crystal is grown in atmosphere comprising a gas mixture of nitrogen gas under a temperature range of 100°C to 1500°C, preferably 500°C to 1100°C, and a pressure range of 100 Pa to 200 MPa, which overlaps the claimed range of temperature and pressure (Abstract and [0026]-[0032]). Furthermore, temperature and pressure are well known in the art to be result effective variables; therefore It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Sasaki by optimizing the temperature and pressure by conducting routine experimentation to obtain the claimed ranges. (MPEP 2144.05).

Referring to claim 14, Sasaki teaches seed crystal with a lateral dimension and GaN growth thereon ([0066]-[0073]).

4. Claims 5 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (US 2006/0051942) as applied to claims 1, 4 and 14 above, and further in view of Sarayama (US 2002/0175338).

Sasaki teaches all of the limitations of claim 5, as discussed above, except an elevating crucible containing said flux until a seed crystal contacts the flux.

In the same field of endeavor pertaining to GaN single crystal growth, Sarayama teaches a means of elevating a crucible towards a seed crystal which is disclosed as a means of effective

growth and facilitation of the nitride crystal from a seed base. (Figs 15A and Figs 15B, [0151]-[0164]).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Sasaki by using the elevator taught by Sarayama, to facilitate an efficient and high quality means of GaN single crystal growth.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki as applied to claims 1, 4 and 14 above, and further in view of D'Evelyn (US 2006/0096521).

Sasaki teaches all of the limitations of claim 6, as discussed above, except a system for hot isostatic pressing.

In a method of GaN single crystal growth, D'Evelyn teaches a means of using hot isostatic pressing which can enable a reduction of crystal defects in the growth crystal (Abstract and [0009]-[0010], [0024]-[0028]).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Sasaki by incorporating the teachings of D'Evelyn to facilitate higher quality and defect reduced crystal structures.

6. Claims 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (US 2006/0051942) as applied to claims 1, 4 and 14 above, and further in view of Kitaoka (US 2004/0144300).

Sasaki teaches all of the limitations of claim 11, as discussed above, except Sasaki does not teach a growth rate of at least 25 micron/hr.

In a method GaN single crystal growth, Kitaoka teaches a GaN growth with a growth rate of 20 micron/hr or more ([0038]). Kitaoka also teaches a nitrogen pressure of 2 to 100 atm and the use of sodium ([0040] and [0049]).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Sasaki by incorporating the teachings of Kitaoka to achieve a high growth rate, thereby facilitating rapid bulk crystal growth.

Response to Arguments

7. Applicant's arguments with respect to claims 1, 4-6, 11 and 13-14 have been considered but are moot in view of the new ground(s) of rejection.

8. Applicant's arguments filed 9/26/2011 have been fully considered but they are not persuasive.

Applicant's argument that the temperature and pressure range produces unexpected results is noted but not found persuasive. First, the declaration fails to provide any evidence of criticality of the claimed ranges. Second, there is no comparison with the closest prior art to show an unexpected result. Third, the declaration alleges the unexpected result is increase growth rate, however growth rates of greater than 20 microns/hr to 50 microns/hr are conventionally known in the art, as evidenced by Kitaoka et al (US 2004/0144300); therefore the alleged unexpected results are not unexpected. Finally, the claims are not commensurate in scope with the alleged unexpected results because claim 1 does not recite any growth rate.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW SONG whose telephone number is (571)272-1468. The examiner can normally be reached on M-F 11:00-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Kornakov can be reached on 571-272-1303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Matthew J Song
Primary Examiner
Art Unit 1714

/Matthew J Song/
Primary Examiner, Art Unit 1714